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The Role of Digital Technology in Shaping Learning Styles Among Filipino Students

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Abstract**—***This paper is action research which investigated the role of digital technology in shaping learning styles among Filipino students. Findings showed that the technologies commonly used in Fullbright College to enhance education and to shape the learning styles of the students are the interactive learning software, the learning management systems, Smart classrooms solutions, educational apps, E-books and digital textbooks, and adaptive learning systems. Some keyways to implementing digital technology in school in shaping learning styles are through utilizing the digital technology to allow students to access lectures and education materials from anywhere. students encountered in studying by enhancing digital technology in learning are difficulties in access and equity. This disadvantages students with limited access to digital resources. In terms of students' engagement, they are facing challenges such as digital distractions and motivation*.

Keywords**—** *Digital technologies Interactive learning learning styles students' diversity*.

I. INTRODUCTION

1. The nature and reach of education have changed as a result of digital technology, and ICT integration strategies and policies have been adopted by educational institutions all around the world. The latter raised concerns about the effectiveness of using ICTs for teaching and learning, particularly with regard to comprehending, modifying, and designing educational programs in line with contemporary technology developments. Questions about digitalization in schools were raised by the recent COVID-19 pandemic, which expedited the adoption of digital tools in education.
2. These issues were highlighted during the pandemic. The latter raised concerns about the effectiveness of using ICTs for teaching and learning, particularly with regard to comprehending, modifying, and designing educational programs in line with contemporary technology development. In particular, a lot of schools showed a lack of expertise and poor level of digital capacity, which led to growing disparities, learning losses and gaps. These findings have made it necessary for educational institutions to learn from and expand upon their experience in order to improve their digital readiness and capability, raise their degrees of digitalization, and carry out a successful digital transformation.
3. The disruptive and versatile technology innovations have created new avenues for teaching and learning advancement, including smart devices, the Internet of Things (IoT), artificial intelligence (AI), augmented and virtual reality (VR), blockchain, and software application (Gao & Prasolova-Forland, 2021). As a result, in recent years, educational systems all over the world have prioritized changing their educational agenda to incorporate ICT integration strategies of policies, and they have also increased their investment in ICT integration (Fernandez-Gutierez et al., 2020).
4. Research indicates that although funds have been allocated for the incorporation of technology into classrooms, the outcomes have not materialized as expected (Delgado et al., 2015; Lawrence & Tar, 2018). The COVID-19 pandemic made these problems worse by forcing all levels of education to switch to online instruction (Daniel, 2020). Online instruction hastened the adoption of digital technology, raising concerns about the kind, scope, and efficacy of school digitalization (Cachia et al, 2021). According to Blasko eta l, (2021), numerous schools specifically showed a lack of expertise and insufficient digital competence, which led to growing gaps, inequities and learning losses.
5. These findings have led to the requirement that educational institutions acquire knowledge and expand their expertise to improve their digital capabilities (European Commission, 2020) and raise their degrees of digitalization (Costa et al., 2021). Digitalization affects many facets of a school's development and presents opportunities for fundamental improvements in education (OECD, 2021). However, it is a complex process that requires large-scale transformative changes beyond the technical aspects of technology and infrastructure (Pettersson, 2021)
6. Given that the majority of Philippine schools now use digital technology to carry out the curriculum, evaluations of the quality of instruction and learning are necessary at all times. Taking into account the various learning preferences and types of university students is one of the crucial actions to guarantee a high-quality and ideal learning experience. In light of this, this paper evaluates how digital technology influences Filipino students' learning preferences, with a focus on Fullbright College.

A. Research Questions

This study sought to answer the following questions:

1. What are the most commonly used digital platforms by Filipino students for personalized learning?
2. What are the key advantages of integrating digital technology in shaping and accommodating diverse learning styles among Filipino students?

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3. How do Filipino educators incorporate digital technology to accommodate varying learning styles among students?
4. What are Filipino students' perceptions of the impact of digital technology on their learning styles?
5. What are barriers and challenges faced by Filipino students in accessing and utilizing digital technology to align with their learning styles?

B. Innovation, Intervention, and Strategy

The conduct of this study will be helpful in making sound decisions, especially in schools. This paper will give insights to the school management about the actual role of digital technology in shaping the learning styles among students of Fullbright College. The results would give them ideas about the implications of DIGITAL technology interventions in shaping learning styles.

1. Moreover, this research would not be in effect without the coordination with the school management of Fullbright College. The findings would be presented to the management for the basis in providing more programs and activities that would help both the students and faculty to make digital technology more efficient in shaping learning styles.
2. Furthermore, results could also be Disseminated to the students. This could make them aware and assess themselves about the role and implications of the intervention of digital technology in shaping their own learning styles.

II. RESEARCH METHODOLOGY

Design

This study is action research that uses qualitative methods to investigate the role of digital technology in shaping learning styles among students particularly in Fullbright College. This mainly aimed to simultaneously investigate and solve a particular issue. As Parsons and Brown (2002) explained that action involves systematic observations and data collection which can be then used in reflection, decision making and the development of more effective classroom strategies.

Participants and Sources of the Study

The target participants of this study are the students and teachers of Fullbright College. A total of at least 60 students and 20 teachers from three different course departments shall be obtained.

A semi-structured interview questionnaire is utilized as the primary source of this study. This enhanced the collection of data from the target sample. Teachers' artifacts such as teaching materials and records could also be useful to further elaborate and analyze the role of digital technology in shaping learning styles.

Data Gathering Methods

After the study focus has been finalized, the researcher presents the purpose of the study to the management of Fullbright College and sends a letter asking permission to conduct data collection from the target participants.

Then, the actual data collection started. The researcher coordinated with the advisers of the target students' participants for her to have consents to conduct an interview with the students. A total of 15 students and 4 teachers have been completed per department namely, Department of Education, Criminology, Engineering, and Business.

Once the data is complete, Braun and Clarke's (2013) method of data analysis will be used for this type of qualitative research.

Data Analysis

To analyze the collected data, the researcher transcribes the conducted interviews. The categorizing, transforming and interpreting data into useful information into a professional pathway. The data analysis will start with data encoding to establish a framework of thematic ideas.

The researcher utilized Braun and Clarke (2013), this reflects the facts that the data have been summarized and organized rather than analyzed. Researchers use thematic analysis to identify, analyze and report on recurring patterns. This is utilized to describe the data and it involves interpretation in the process of selecting codes and constructing themes. This is then followed by a certain processes such as transcription of the responses of the participants by the researcher, gathered the significant statements in one place; created formulated meaning: In this stage, using the significant statement gathered from the participants' narratives, the researcher attempted to formulate more general restatement or interpretation for each one; the formulated meanings by the researcher will be grouped or organize into cluster theme, for example, one statement may pertain to faith while another might be referring to self-awareness; then develop themes or emergent themes after having the coding *structure.*

Ethical Consideration

The researcher provides informed consent for the respondents. This includes information about the study's benefits, risks, and institutional approval. They are told that their information will be confidential and that they can stop the interview at any time and for any reason. They can also withdraw their information by contacting the researcher.

III. PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

Most Digital platforms used in Fullbright College to Shape the Learning Styles

There were various platforms commonly used to enhance education nowadays. Some of these are interactive learning software, learning management systems (LMS) and smart classroom solutions. These are the digital technologies that are mostly used by the teachers in Fullbright College to shape the learning styles based on the result of this study.

Interactive learning software includes educational applications, simulations, and games designed to engage students by teaching them important concepts. The learning management systems platforms streamline the management of educational content and resources. They enable teachers to organize course materials, assessments, and communication

with students in one place, making it easier to deliver and track learning outcomes just like what respondent 5 stated, ".. this platform really helped me a lot and made everything more organized".

The results of the Tsoury (2023) study point to correlations between increased usage of interactive learning strategies and improved course instruction, higher perceived efficacy of distant learning, and higher student evaluation ratings. A more intriguing conclusion suggests that the perceived clarity of teaching and learning efficacy is strongly influenced by the employment of a variety of interactive learning approaches, in addition to their level of use. They advise academic staff to incorporate a range of interactive teaching techniques, particularly brief knowledge assessments, into their courses (both online and in-person). This recommendation is based on their research findings. Beyond these outcomes, the prediction model they developed can be used to investigate the combination of various interactive learning strategies that might raise students' assessments of a particular course.

Some Fulbright College faculty use smart classroom solutions. This equipped with devices like interactive digital boards, smart TVs, digital whiteboards, or smart projectors, smart classrooms create an immersive learning environment, facilitating real-time interaction and collaboration, making lessons more engaging and interactive. Respondent 7 stated, "Mas alive ang class pag may devices like these. Classes are more interactive and engaging".

There were also teachers using educational apps to shape the learning styles of the students. This encompasses a wide variety of tools from language learning apps to math practice apps, providing students with a one- stop learning solution accessible on tablets, smartphones and computers. This allows students to personalize their educational journey. Most teachers have used this digital technology to shape students' learning styles, especially during the pandemic. One of the respondents said, "Sobrang laking tulong ng mga educational apps lalo na noong pandemic, everything is transacted online, even the classes .. ".

This statement is supported by respondent 4 saying that, "educational apps helped a lot during the pandemic, making it easier for the students to explore and access information and classes ..".

The outcomes of the study of Ababa et al., (2021) showed that educational apps considerably raised the students' academic performance, particularly in the course subjects. When it comes to completing schoolwork and tasks, educational apps is a useful resource. This clearly demonstrates the strong relationship between educational apps and students' academic profiles. Although the success of applying this may be demonstrated by the results, certain features are still missing. The researchers suggest using apps that are relevant and acceptable for specific categories, having reminders prior to the deadline, utilizing a range of teaching methods, personalizing the app, and using applications for book and library searches to achieve the best possible performance from educational apps. With these cutting-edge features, educational apps became more dependable and dynamic, allowing students to learn more easily.

E-books and digital textbooks were also utilized in Fullbright College to shape the learning styles of the students. It is a more interactive and portable alternative to traditional paper textbooks. They are accessible on devices like tablets and smartphones, eliminating the weight of physical books and enabling students to have hundreds of textbooks in one digital device. There were few teachers using adaptive learning systems. These systems personalize the learning experience for each student by using data and algorithms to tailor content based on individual strengths and weaknesses. This ensures that students receive the support they need to excel.

Digital Libraries were also utilized in the College. It digitizes the learning process by providing rich digital content for students, accessible on devices like tablets, notebooks, and android laptops. These resources improve the learning environment and make learning more interesting and interactive. The study conducted by Matusiak (2019) reveals that the perceived usefulness and usability, particularly the simplicity of use, have a significant impact on users' intents to adopt and use digital collections for academic learning and teaching.

Key advantages of integrating digital technology in shaping and accommodating diverse learning styles among students

There are several benefits to incorporating digital technology into the classroom, including the ability to better shape and support students' varied learning preferences. With this method, learning experiences may be tailored to each student's requirements and preferences, increasing knowledge, engagement, and academic performance.

The findings of this research demonstrated that a multitude of tools and resources are available on digital platforms, which may be tailored to accommodate various learning preferences. A subset of participants held the opinion that interactive infographics, films, and simulations that visually appeal and captivate viewers can be advantageous for learners who process information visually. Though kinesthetic learners can actively explore topics through virtual simulations, interactive games, and hands-on activities that entail movement and physical interaction, auditory learners can engage with sound-based content through podcasts, audiobooks, and online lectures. Blogs, online forums, and writing platforms that let read-and-write learners convey their ideas through text can be great places for them to flourish. According to Singh et al., (2023), digital technologies have brought about a revolution in the education sector by offering personalized learning experiences, innovative teaching strategies, flexible curriculum development, efficient assessment processes, and enhanced collaboration and communication. The usage of digital technologies in education has improved student accessibility and engagement since they can support a range of learning methods.

Further, Collins et al. (2018) provide a historical overview of the use of technology in education by following the evolution of educational technologies from the earliest days of radio and television to the present. Subsequently, the authors discuss the potential benefits and drawbacks of integrating

digital technology into the classroom, examining topics such as blended, online, and personalized learning. Among the book's primary areas of dispute is the notion that, despite their potential to revolutionize education, digital technologies will require significant changes to educational policy and practice.

The findings show that, in comparison to traditional approaches, digital technologies provide a more dynamic and interesting learning environment that lets students learn at their own pace and in a way that suits their own tastes.

Ways on how educators incorporate digital technology to accommodate varying learning styles among students

This study identified ways of implementation of digital technology in school in shaping learning styles. One of which is in Flexible learning. Digital technology allows students to access lectures and educational materials from anywhere globally, breaking traditional geographical barriers.

Digital technology implementation is also applied by the teachers in Fullbright College in individualized learning. Tools like online teaching videos and virtual classrooms cater to diverse student needs, such as work obligations or different learning styles. It is also involved in terms of parental engagement. Digital communication options enable parents to stay involved in their children's education, promoting responsive parenting.

Respondents also used digital technology in terms of student engagement. They implemented it in school to shape the learning styles of the student. One of the respondents stated that, "Nakakatulong din ang mga multimedia platforms para mas maintindihan nila ang mga komplikadong mga topics at mapanatili din yung motivation nila na matuto pa.."

This statement explains that multimedia formats like videos and animations deepen the students' understanding of complex concepts. Techniques like points, badges, and leaderboards motivate students, enhancing engagement and promoting learning objectives. A study of Santiago et al., (2021) results showed that the most popular e-learning materials and instructional tools were cell phones and mobile applications. When lessons were scheduled synchronously, Google Meet served as the meeting platform, and Google Classroom was the most popular online learning tool. It was discovered that students had proficient knowledge of online learning environments and meeting spaces.

Moreover, students become more engaged in learning and the educational process itself improves when technology is employed effectively, according to Haleem et al. (2022). Accessibility and quicker adoption of digital learning have been greatly aided by e-learning systems' compatibility with new smart devices like phones and tablets. Added to this are specialized learning products including games, animation, and AI-driven edutainment platforms. Advances in technology have made it easier to learn about a variety of subjects and age groups. According to Lewis et al. (2017), one crucial but frequently disregarded aspect of education technologies is the significance of big data and the application of analytics to learning. As they use virtual learning environments more frequently, educational organizations such as schools are realizing the importance of having complete student and instructor performance data.

Perceptions of Filipino Students towards the impact of digital technology

Though digital platforms offer numerous benefits, some students may be apprehensive about the potential impact on their learning styles. Two common concerns are the potential for distraction and information overload. With so much online information and multimedia content available to them, students may find it challenging to focus and prioritize their study. Dependence on digital media can also lead to a decline in critical thinking skills since students may resort to it instead of conducting in-depth study and introspection in quest of quick answers.

The result of this study shows that many students reported improved access to educational materials and online courses. Most of them mentioned that incorporating digital platforms is a convenient style of learning. Some of the topics are searchable and they have more opportunities to discover their learning strategies through their own efforts. Furthermore, Flores et al., (2023) stated that these platforms offer access and flexibility, allowing students to learn anytime, anywhere, adapting to their individual needs. Besides, there were students who perceived that it will have a great impact on their learning strategies by understanding and applying the significance of digital technology in their learning process.

Moreover, students value platforms for collaboration on projects, enhancing teamwork skills. In the result of this study, some students assume that it will be convenient and accessible, since hybrid classroom integration of digital technology takes place. This means collaborative learning happens. The things they personally learned can be discussed in face-to-face classes. Similarly, Smith (2015) documents the various ways that interactive digital technologies facilitate collaborative learning for teachers and students. Additionally, if digital technologies are employed as a communicative, interactive tool to facilitate collaboration and knowledge production, they can enhance the caliber of educational experiences.

Limited access to technology and the internet presents difficulties for certain students. Few students thought that the hardest part was that some students are lazy and don't put in the extra effort to learn how to use digital technologies. Issues with electricity and internet connections are among the problems. In this context, education is greatly aided by the incorporation of digital technology with conventional learning.

Challenges that the students encountered in studying by accessing and utilizing digital technology in learning

Enhancing digital technology in learning presents several challenges that educators and students may encounter. Based on the result of this study, one of the challenges that the students encounter is the student engagement such as digital distractions and motivation.

Students may face distractions from social media, games, or other non-educational content, impacting their focus and

engagement in the learning process. Like what respondent 4 stated,

"Mabilis maka distract ang ibang app like social media, minsan di ko napapansin na naglalaro na pala ako, nakalimutan ko na ang dapat gagawin ko.." ~

This statement is supported by respondent 7, saying that,

"madali ako ma distract ng ibang app katulad ng social media, facebook, tiktok.. tapos yun mawawala na ako sa pokus.. "

This shows that maintaining student motivation and engagement in a digital learning environment can be challenging, especially for students who require more hands-on interactive learning experiences.

Disparities in access to technology and the internet can widen the achievement gap, disadvantaged students with limited access to digital resources. Implementing digital technology can be expensive, and schools with limited budgets may struggle to provide equal opportunities for all.

IV. Summary of Findings, Conclusions And Recommendations

Summary of Findings

Based on the data collected, findings showed that the technologies commonly used in Fullbright College to enhance education and to shape the learning styles of the students are the interactive learning software, the learning management systems, Smart classrooms solutions, educational apps, E-books and digital textbooks, and adaptive learning systems.

Some keyways to implement the digital technology in school in shaping learning styles are through utilizing the digital technology to allow students to access lectures and education materials from anywhere. Also, online teaching videos and virtual classrooms cater to diverse student's needs.

In terms of challenges that the students encountered in studying by enhancing digital technology in learning are difficulties in access and equity. This disadvantages students with limited access to digital resources. In terms of students' engagement, they are facing challenges such as digital distractions and motivation.

Conclusions

Digital technology has been instrumental in reshaping learning styles in schools by offering innovative ways to personalize education. Considering the results of this study, digital technology plays a pivotal role in shaping the learning styles of students by offering innovative tools and platforms that enhance engagement, collaboration, and accessibility. the impact of technology on student learning is profound, ranging from personalized learning paths to improved collaboration, distance learning opportunities, and enhanced access to information. By incorporating interactive learning tools, personalized learning approaches, and innovative resources, technology transforms traditional teaching methods into dynamic, interactive and tailored experiences that cater to individual student needs. It empowers students to learn at their own pace, fosters critical thinking, and prepares them for the demands of the modern workforce by enhancing their technical proficiency and adaptability. Moreover, technology promotes collaborative learning, communication, and global connectivity, fostering cultural exchange and developing essential 21st century skills.

The perception of students towards the impact of digital platforms on learning styles is multifaceted. While digital platforms offer numerous benefits, such as catering to diverse learning styles and increasing accessibility, they also present challenges in terms of distraction and information overload. Filipino students generally perceive digital technology positively, recognizing its benefits in education and social interactions while also acknowledging challenges.

Overall, digital technology revolutionizes education, creating inclusive, engaging, and adaptable learning environments that equip students with the skills necessary to thrive in an increasingly digitized and interconnected world.

Recommendations

While digital platforms enhance learning, it's crucial to recognize potential drawbacks and understand that they are not a one-size- fits –all solution. Teachers need to consider various factors like students' preferences, technical capabilities, and specific learning objectives when deciding on the most appropriate tools and methods to use in the learning process.

By leveraging digital technology effectively, schools can create more engaging, personalized and inclusive learning environments that cater to the diverse needs of students, promoting active participation, deeper understanding, and improved academic performance.

To optimize the beneficial effects of digital platforms on learning styles, instructors must aid students in effectively navigating the digital environment by offering direction and support. It is also a good initiative to provide students with eh necessary tools and internet access, enhance student's ability to navigate digital platforms effectively and promote programs that address the psychological impacts of digital technology usage.

Teachers may create an environment in the classroom that equips students to succeed in the digital age by balancing technology and conventional teaching approaches. While digital technology offers numerous benefits in education, addressing the challenges is essential to maximize its potential and ensure equitable access to quality learning experiences. By proactively addressing issues related to access training, privacy, curriculum, alignment, student engagement, and inclusivity, schools can overcome the challenges to enhance and shape the learning styles and experience for all students.

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